

**FOURTH FIVE-YEAR REVIEW REPORT  
CHEMICAL CONTROL CORPORATION SUPERFUND SITE  
UNION COUNTY, NEW JERSEY**



Prepared by  
U.S. Environmental Protection Agency  
Region 2  
New York, New York

September 2014

Approved by:

A handwritten signature in black ink, appearing to read "Walter E. Mugdan", is written over a horizontal dashed line.

Walter E. Mugdan, Director  
Emergency and Remedial Response Division

Date:

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## **Executive Summary**

This is the 4<sup>th</sup> five-year review for the Chemical Control Corporation Superfund Site located in Union County, New Jersey. The purpose of this five-year review is to review information to determine if the remedy is and will continue to be protective of human health and the environment. The triggering action for this statutory five-year review was the completion of the 3<sup>rd</sup> five-year review in May 2009.

No monitoring data was collected in the last five years. Historic data indicate that the in-situ remediation reduced concentrations for the site related contaminants to non-detect levels in the groundwater wells located outside of the slurry wall. This five year review recommends that groundwater monitoring be resumed. After samples are collected and evaluated, EPA will evaluate the protectiveness of the remedy.

## Five-Year Review Summary Form

SITE IDENTIFICATION		
Site Name: Chemical Control Corporation		
EPA ID: NJD000607481		
Region: 2	State: NJ	City/County: Elizabeth/Union County
SITE STATUS		
NPL Status: Final		
Multiple OUs? No	Has the site achieved construction completion? Yes	
REVIEW STATUS		
Lead agency: EPA <i>[If "Other Federal Agency", enter Agency name]:</i> Click here to enter text.		
Author name (Federal or State Project Manager): Nigel Robinson		
Author affiliation: EPA		
Review period: 1/7/2009 - 9/6/2014		
Date of site inspection: 9/4/2013		
Type of review: Statutory		
Review number: 4		
Triggering action date: 5/20/2009		
Due date (five years after triggering action date): 5/20/2014		

Issues/Recommendations				
OU(s) without Issues/Recommendations Identified in the Five-Year Review:				
Issues and Recommendations Identified in the Five-Year Review:				
OU(s): 01	Issue Category: Remedy Performance			
	Issue: No groundwater data was collected during this five-year review period.			
	Recommendation: It is recommended that groundwater monitoring be resumed for the next five-year review.			
Affect Current Protectiveness	Affect Future Protectiveness	Party Responsible	Oversight Party	Milestone Date
No	No	PRP	EPA	7/1/2015
OU(s): 01	Issue Category: Institutional Controls			
	Issue: No Institutional controls are in place			
	Recommendation: Implement ICs			
Affect Current Protectiveness	Affect Future Protectiveness	Party Responsible	Oversight Party	Milestone Date
No	Yes	PRP	State	7/1/2019

Sitewide Protectiveness Statement	
Protectiveness Determination: Short-term Protective	Addendum Due Date (if applicable):
Protectiveness Statement: The remedy remains protective of human health and the environment in the short-term. In order for the remedy to be protective in the long-term, institutional controls need to be implemented and groundwater monitoring should be resumed.	

## **Introduction**

The purpose of a five-year review is to evaluate the implementation and performance of a remedy in order to determine if the remedy is and will continue to be protective of human health and the environment and is functioning as intended by the decision documents. The methods, findings, and conclusions of reviews are documented in the five-year review. In addition, five-year review reports identify issues found during the review, if any, and document recommendations to address them.

This is the 4<sup>th</sup> five-year review for the Chemical Control Corporation site (site), located in Elizabeth, Union County, New Jersey. This five-year review was conducted by the United States Environmental Protection Agency (EPA) Remedial Project Manager (RPM) Nigel Robinson. The review was conducted pursuant to Section 121(c) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended, 42 U.S.C. §9601 *et seq.* and 40 CFR 300.430(f)(4)(ii), and in accordance with the *Comprehensive Five-Year Review Guidance*, OSWER Directive 9355.7-03B-P (June 2001). This report will become part of the site file.

The triggering action for this statutory review is the previous five-year review, signed May 20, 2009. A five-year review is required at this site due to the fact that hazardous substances, pollutants or contaminants remain at the site above levels that allow for unlimited use and unrestricted exposure. The site consists of one Operable Unit, which is addressed in this five-year review.

## **Site Chronology**

See Table 1 for the site chronology.

## **Background**

### *Physical Characteristics*

The 2.2 acre Chemical Control property is located at 23 South Front Street, Elizabeth, New Jersey. It is part of a narrow peninsula formed by the Elizabeth River and the Arthur Kill. This peninsula was a marsh until it was filled in to prepare it for industrial development in the 1800s. The Elizabeth River, the Arthur Kill, and the water table aquifer at the site are saline and tidally influenced.

### *Site Geology/Hydrogeology*

At the shallowest depths below ground surface, a combination of Pleistocene-aged glacial deposits and artificial fill are found in the vicinity of the site. Recent geologic depositional history is from overbank stream deposits formed after the glacial retreat. Mud and silts with inclusions or organic materials are common in the Newark area and along the Arthur Kill. Of particular note at the site is a clay layer found at between 14 and 18 feet below ground surface that serves as a barrier to flow between shallow and deeper groundwater. Over time, much of the low-lying coastal land was built up with artificial fill, including the area of the site; as much as

nine feet of fill material has been measured at the site.

The underlying bedrock below the site is the Brunswick Formation, part of the Newark Group of sediments deposited in the Newark Basin during the Triassic Period. In the vicinity of the site, the Brunswick Formation is characterized as fine-grained shale to siltstone and has a characteristic red color.

The range in depth to groundwater is approximately four to seven feet below ground surface. Shallow groundwater shows tidal influence and is saline, consistent with a close interchange with surface water of the Elizabeth River and the Arthur Kill, both estuary waters of the Atlantic Ocean. Due to the salinity of the groundwater, the groundwater is not considered a drinking water source.

#### *Land and Resource Use*

Land use in the immediate site vicinity is industrial. The site is bordered on the south, across South Front Street, by Trevcon Construction Co., Inc., facility, a marine construction company, on the east by an empty abandoned building, on the north by the Elizabeth River, and on the west by an empty lot, formerly a scrap metal yard. Although the surrounding area is mostly industrial, there are residential properties within a few hundred feet from the site. Densely populated neighborhoods are located across the Elizabeth River and the total population of the City of Elizabeth exceeds 125,000 residents. The site is currently an empty and unused lot. The City of Elizabeth is supplied by municipal water and installation of groundwater wells at or around the site for potable use is unlikely. A prospective purchaser has expressed interest in acquiring the property, discussions with this party are ongoing.

#### *History of Contamination*

From 1970 to 1978, Chemical Control Corporation operated as a hazardous waste storage, treatment, and disposal facility, accepting various types of chemicals including: acids, arsenic, bases, cyanides, flammable solvents, polychlorinated biphenyls (PCBs), compressed gases, biological agents and pesticides. Throughout its operations, the Chemical Control Corporation was cited for discharge and waste storage violations. The facility operated until March 1979, when it was closed due to numerous environmental and safety violations by the New Jersey Department of Environmental Protection (NJDEP).

#### *Initial Response*

The State's initial cleanup of the site starting in March 1979 removed 55,400 pounds of bulk solids, 1,800 gallons of bulk liquids, nearly 10,000 drums of waste, 83 gas cylinders, 10 pounds of infectious wastes, seven pounds of radioactive wastes and 24 gallons of highly explosive liquids. While the emergency response action was still in its early stages, on April 21, 1980, an explosion and fire occurred at the site.

NJDEP continued its (pre-Superfund) cleanup operation after the fire and removed all building debris, drums (found on and buried below the surface), tanks and three feet of surface soil. NJDEP operated a groundwater recovery and treatment system from November 1980 through July 1981.



## *Basis for Taking Action*

The Chemical Control site was proposed for inclusion to the National Priorities List (NPL) of Superfund sites in October 1981. The site became final on the NPL in September 1983. A remedial investigation and feasibility study (RI/FS) was conducted at the site from 1985 to 1986. The study determined that contaminants found in the soils, groundwater, surface water and sediments included, but were not limited to, the following:

Acetone	2-butanone
vinyl chloride	benzene
toluene	ethylbenzene
chlorobenzene	trichloroethane
1,2-dichloroethene	PCBs
di-n-butyl phthalate	benzyl alcohol
benzoic acid	pyrene
naphthalene	fluorene

At the time of the RI/FS, the greatest potential risk from the site was the possible exposure to contaminated soils. Significant health threats were posed through direct contact, fugitive dust emission and volatilization. However, these risk factors were significantly reduced as the contaminated soils were below the water table and a layer of gravel; in addition, the site was fenced. The risk posed by the groundwater was minimal as it is saline and is not a drinking water source. Residents and businesses in the area are supplied with municipal water.

Very low levels of contamination were found in the Elizabeth River. Higher levels of contamination were found in the sediments, however, data failed to show any trend linking the contaminants to the site. Such a link was difficult because of the other multiple sources of contamination along the river. The river is lined with junk yards, oil tank farms, chemical manufacturers, and storm water runoff from much of the city's street. Remediation of the river sediments was not included as a component of the site remedy as remediation of the soils would eliminate the source of contaminant migrating from site soils but not from the other multiple sources.

Ecological risks were not evaluated during the RI/FS.

## **Remedial Actions**

### *Remedy Selection*

Based on the results of the RI/FS, EPA signed a second ROD for the site on September 23, 1987. The first ROD, signed in 1983 was an initial remedial measure to remove gas cylinders, box trailers and a vacuum truck from the site.

The September 23, 1987 ROD called for:

- Treatment of 18,000 cubic yards of contaminated soil at the site using *in-situ* fixation;
- Removal of debris from earlier response actions;
- Sealing of the sanitary sewer line under the site where it connects to the South Front Street

- storm sewer.
- Repair of the berm that separates the site from the Elizabeth River; and
- Collection and analysis of environmental samples, as required, to ensure the effectiveness of the remedy.

### *Remedy Implementation*

On October 23, 1990, the Primary Settling Defendants (PSDs) for the Chemical Control Corporation entered into a Consent Decree with EPA for the implementation of the remedy as selected by the ROD. Construction started at the site in August 1993 and was completed in April 1994.

In addition to implementing the components of the ROD, the PSDs incorporated a slurry wall into the remedy; the slurry wall was installed around the perimeter of the site prior to the solidification of the soils. The purpose of the slurry wall was to further isolate and contain the solidified soils. The slurry wall was constructed around the perimeter of the site and anchored into a clay layer underlying the site. By anchoring the slurry wall into the clay layer, the surrounding groundwater was cut off from entering and leaving the site. The site was then divided into sections. For each section, the soils were removed to the depth of the clay layer and stockpiled at one of the adjacent sections. The stockpiles were then placed in approximately 5 to 7 foot tall stockpiles. These stockpiles were then mixed in place with Portland cement and water. Samples of the mixture were taken to determine if the solidified soils were meeting the established performance criteria for unconfined compressive strength, permeability test, leachability test and volume increase. After samples from the recently solidified section met all the performance criteria, another 5 to 7 foot stockpile of soil was mixed, solidified and then placed on top of the previously solidified soil. Samples for performance criteria test were again taken and analyzed. This process was repeated throughout the site until the entire site was solidified. The solidified mass extended to a depth of seventeen feet below ground surface. A virgin mixture of concrete was added to the top of the solidified mass to provide a barrier between the exterior elements, such as rainfall, and the solidified soils. The top surface of the concrete was then pitched to prevent water infiltration into the solidified mass and to maximize surface water runoff toward the Elizabeth River. The solidified mass and concrete was then covered with a layer of gravel. Finally, an 8-foot chain-link fence was installed around the site to restrict unauthorized access. The final inspection of the site was conducted on April 21, 1994 and the Remedial Action Report was finalized on September 30, 1994.

### *System Operations/Operation and Maintenance*

The PSDs have been conducting long-term monitoring and maintenance activities in accordance to the operation and maintenance (O&M) plan, approved by EPA November 1992. The primary activities associated with the O&M plan are:

- Visual inspection of the surface and solidified mass with regard to erosion, drainage and the security of the chain-link fence;
- Hydraulic conductivity testing of the stored stabilized soil samples/cores;
- Groundwater and surface water sampling; and

- Groundwater elevation monitoring.

Since 2009, only visual inspection of the site and hydraulic conductivity testing of the stored stabilized soil samples/cores have been performed. Groundwater and surface water contaminant levels surrounding the site collected before 2009, were determined to be background from sources other than the site, and have not decreased since soil remedy was implemented.

### **Progress Since Last Five-Year Review**

#### **Protectiveness Statement from the Last Five-Year Review**

The third five-year review for the site, completed in May 2009, concluded that the remedial action was protective of human health and the environment in the short-term. In order to be protective in the long-term, institutional controls needed to be implemented and residual benzene, toluene, ethylbenzene and xylenes (BTEX) contamination in soils, typically the product of Fuel oil spills, located outside the slurry wall and the Elizabeth River, needed to be addressed.

#### **Status of Recommendations and Follow-up Actions**

1. No Groundwater or surface water monitoring is occurring - Resume groundwater monitoring.

As explained in the previous five-year review, the three monitoring wells along the Elizabeth River outside the slurry wall were placed in locations containing contaminated soils. Results from these groundwater monitoring wells through 2008 have shown the contaminants to be from the residually contaminated soils located outside of the slurry wall. BTEX contaminants unrelated to the site were also found in the wells, it is likely that they came from a former motor vehicle junkyard, which was located adjacent to the site. The BTEX contaminants were determined to be unreliable for testing the integrity of the slurry wall. Groundwater sampling was not resumed nor was the existing well network re-evaluated.

2. Residual BTEX activities – no further action

BTEX contaminants are not site related, previous bio-remediation treatment was effective in reducing the concentrations.

3. Fence around site does not prevent access - Repair fence

As recommended, the fence was repaired to prevent access to the site.

4. Institutional controls not in place - Implement ICs such as deed notice and a Classification Exception Area (CEA).

The PSDs are working with NJDEP to implement a CEA for the site. A prospective purchaser has shown interest in acquiring the property by paying the outstanding tax lien. If this acquisition is successful, there will be a legitimate owner of the property which will allow for the placement of a deed notice on the property.

## Five-Year Review Process

### *Administrative Components*

The five-year review team included Nigel Robinson (EPA-RPM), Michael Scorca (EPA-Hydrologist), Lora Smith-Staines (EPA-Human Health Risk Assessor), Michael Clemetson (EPA-Ecological Risk Assessor) and Natalie Loney (EPA-Community Involvement Coordinator). This is a PRP-lead site.

### *Community Involvement*

Notification of this five-year review was published on the EPA's website.

Once the five-year review is completed, the results will be made available at the local site repository, which is located at the Elizabeth Public Library, 11 South Broad Street, Elizabeth New Jersey 07202. In addition, efforts will be made to reach out to local public officials to inform them of this five-year review.

### *Document Review*

The documents, data and information which were reviewed in completing this five-year review are summarized in Table 3.

### *Data Review*

#### Solidified Mass Testing

During implementation of the chemical fixation remedy, core samples were collected of the solidified mass. The core samples, which are stored at a secure location away from the site, allow the permeability of the solidified soils to be tested without compromising the integrity of the site through new drilling or cutting. The result of this testing program is extrapolated to assess the performance of the solidified mass. In accordance with the O&M plan, one solidified soil core sample is tested per year to determine its permeability. Table 3 lists the solidified core permeability test results. The 2013 results indicate a hydraulic conductivity of  $5.69 \times 10^{-8}$  centimeters per second (cm/sec). The overall permeability of the samples has decreased over time and has reached permeability values in the range of  $1$  to  $2 \times 10^{-9}$  cm/sec. This range exceeds the performance standard established in the Statement of Work, via the 1987 ROD, of  $1.5 \times 10^{-5}$  cm/sec and the RCRA composite landfill cap standard of  $1 \times 10^{-7}$  cm/sec.

#### Groundwater and Surface Water Sampling

No groundwater or surface water samples have been conducted since the last five-year review, 2009 – present.

Although groundwater sampling has not been conducted since the last FYR, all groundwater data collected since the soil stabilization activities were completed, showed substantial reduction in contaminants immediately after work was conducted and remained below risk-based levels for the two site indicator contaminants. Specifically, monitoring wells CW-3 and CW-4, and monitoring well CW-5 had minimal to no contamination. The in-situ bioremediation performed

over a 21 month period from 2002 to 2004 between the river and the slurry wall was effective in reducing the contaminants of concern, vinyl chloride and 2-butanone in monitoring CW-3 and CW-4. The concentrations of these site indicator compounds were reduced to non-detect levels, see Figures 3, 4 and 5.

### *Site Inspection*

The inspection of the site was conducted on September 4, 2013. The inspection was conducted by Nigel Robinson, EPA's Remedial Project Manager. The purpose of the inspection was to assess the protectiveness of the remedy. Small shrubs and grasses were observed at various locations throughout the site. Phragmites grew in thick clusters by the fence line along the Elizabeth River in addition to low lying areas along South Front Street. These areas act as catchment basins for rainfall and frequent flooding. Debris such as tires, wood and trash were observed both inside and outside the fence line. The site gate has been damaged, and will need to be repaired or replaced.

### *Interviews*

During this five-year review process, EPA communicated with the PSDs, the State of New Jersey and local government official.

### *Institutional Controls Verification*

The 1987 ROD, the final ROD for the site, made no mention of institutional controls that may be appropriate to assure the protectiveness of the remedy. EPA's experience at other sites since that time has led to an expectation that two types of institutional controls are appropriate for the Chemical Control site:

- A CEA for groundwater, a method of identifying areas of groundwater contamination under New Jersey State statute that assure CEA-designated areas are not used in a manner that would result in exposure to the contaminants. The PRPs are currently working with the State of New Jersey to implement the CEA.
- A deed notice, a land use control, also a New Jersey State statute, that would assure that future use of the site would not disturb the protectiveness of the implemented remedy.

Neither of these institutional controls are yet in place.

### **Technical Assessment**

#### *Question A: Is the remedy functioning as intended by the decision documents?*

The 1987 ROD selected the in-situ fixation of contaminated soils as the remedy for the site. In addition to the selected remedy, the PRP also capped the monolith with concrete/gravel and surrounded the site with a slurry wall keyed into the underlying clay. Groundwater data collected after the monolith was put in place show consistent levels which demonstrates that soils contamination on site is no longer impacting groundwater or the Elizabeth River. Residual contamination outside of the wall is primarily BTEX contamination and is not site related. Due to the contamination from other sites, the PRPs have discontinued groundwater and surface water

monitoring since contaminant concentrations in these media do not reflect impacts from the site. EPA and the PRPs are reevaluating the O&M groundwater requirements and, as appropriate, may make recommendations to modify this plan in the future.

The analysis of cores taken from the monolith over the past five years shows that the monolith meets or exceeds permeability requirements outlined in the ROD. The lot is currently vacant and groundwater underlying the site, which is saline, is not being used as a potable source of water.

EPA and the PRP are pursuing the implementation of ICs restricting future land use and preventing potable uses of groundwater.

*Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives used at the time of the remedy still valid?*

### ***Risk Assessment Methodologies***

Risk assessment methodologies used at the time of the 1987 ROD for the Chemical Control site remain mostly consistent with current methodologies. A more lengthy discussion is provided in the following sections.

### ***Changes in Exposure Pathways***

The most significant exposure pathway indicated in the ROD was direct contact exposure to site soils. Since contaminated soils have been solidified and are below one to three feet of gravel, they have been rendered inaccessible.

Other pathways evaluated as part of the risk assessment include: direct contact with and incidental ingestion of surface water/sediments in the Elizabeth River and dermal contact with leachate from river banks at low tide. Boaters, fishermen, water skiers and swimmers were considered exposed populations accessing the Arthur Kill and the Elizabeth Rivers. While it was noted in the Closure Remedial Investigation – Volume I Report, June 1987 that a likely exposure scenario includes fisherman, no evaluation of fish consumption was made in the risk assessment. Finfish species are mobile and the site exists in a highly industrialized area with many sources contributing to contamination in the Elizabeth River, Arthur Kill and other surrounding waterways, it would be difficult to ascertain whether finfish tissue contaminant concentrations were resulting from the Site. Further, any remediation taken at the Site to minimize finfish tissue concentrations would be inefficient unless other source inputs were controlled. Although a State-issued fishing advisory was in place at the time of the ROD, shellfishing was also observed within three-quarters of a mile from the Site but not immediately adjacent. Shellfish would have been a better indicator of Site impacts on river biota as they are sedentary species. This pathway was not evaluated at the time of the ROD so collection of shellfish at this time would not allow for an evaluation of the effectiveness of the remedy. Since site soil contamination has been immobilized, it is unlikely that current surface water, sediment or biota contamination is a result of the Site; however, groundwater monitoring is required to confirm Site contamination is contained on-property.

Current land use at the site and surrounding properties are primarily industrial and not expected to change in the future. At the time of the ROD, a residence was present 200 feet northeast of the site as well as densely populated neighborhoods located across the Elizabeth River. Currently, the closest residences are approximately 500 feet north of the site but none exist on the industrial peninsula where Chemical Control is located. The Elizabeth River, Arthur Kill and the water table aquifer at the site are all saline and tidally influenced so groundwater at the site was not evaluated for potable use. Since site groundwater is Class IIA, if the risk assessment were performed now, a potable exposure scenario would have been evaluated. This could result in additional site risk; however, it is unlikely that site-contaminated groundwater would ever be consumed based on salinity. Additionally, residents and businesses are supplied with municipal water. The PSDs provided information to the State for consideration of a Classification Exemption Area (CEA) at the Site to prohibit use of site groundwater for potable purposes but as of this five year review, has yet to be implemented.

As mentioned in the previous five-year review, the soil vapor intrusion SVI pathway is not a concern at the site.

### ***Contaminants of Concern***

The primary class of contaminants at the site are organics, including benzene, toluene, ethylbenzene, chlorobenzene, 1,2-dichloroethene, trichloroethylene (TCE) and tetrachloroethylene (PCE), in addition to a few metals (lead in groundwater and arsenic and chromium in surface water). The full list of indicator chemicals from the June 1987 Closure Remedial Investigation also includes: 1,2-dichloroethane, vinyl chloride, chloroform, methylene chloride, benzo(a)pyrene, 4,4'-DDT, the PCB Aroclor 1260, N-nitrosodiphenylamine, nickel, bis(2-ethylhexyl)phthalate, 1,2-dichlorobenzene, chlorobenzene, total xylenes, mercury, phenol, acetone and 2-butanone. Contaminants are present in soil, groundwater, sediment and surface water although Elizabeth River sediments showed no trend with site data in the remedial investigation.

### ***Changes in Standards and TBCs***

The hydraulic conductivity test used at the time of the 1987 ROD has not changed. Archived samples from the solidified mass are regularly tested to determine if they continue to meet the  $1 \times 10^{-5}$  cm/sec standard established in the ROD. To date, all samples tested have met or exceeded the standard.

### ***Changes in Toxicity and Other Contaminant Characteristics***

In September 2011, EPA's Integrated Risk Information System (IRIS) released a Final Toxicity Assessment for TCE and in February 2012, IRIS released a Final Toxicity Assessment for PCE. In the assessments TCE and PCE are characterized as "carcinogenic to humans" by all routes of exposure. Based on these reassessments, toxicity values were modified. Again, since these contaminants were solidified and presumably remain immobile, a discussion of their toxicity is unnecessary.

### ***Validity of the RAOs***

While not formally identified as RAOs, the ROD indicated that the remedial action should: reduce the mobility and toxicity of the contaminants in the soil, protect against any possibility of the contaminated soils being exposed, insure that the leaching of contaminants will not increase, and return the site to a condition that is compatible with future development that could reasonably be expected in this industrial area.

The solidified mass served to immobilize the soil contaminants and along with a gravel cover, prevent direct contact exposure. The solidified mass has minimized the leaching of contaminants as indicated by increased impermeability values of the solidified mass over time. The site could potentially be reused for light industrial purposes.

*Question C: Has any other information come to light that could call into question the protectiveness of the remedy?*

No information has come to light that would call into question the protectiveness of the remedy.

### ***Technical Assessment Summary***

Sample results from the solidified mass surrounded by the slurry wall indicate a continued trend of decreasing hydraulic conductivity of the solidified mass. Although no groundwater sampling has been performed since the last five-year review, the post in-situ bioremediation sampling results indicated effective treatment of the residual contamination between the slurry wall and the bank of the Elizabeth River.

### **Issues, Recommendations and Follow-Up Actions**

Issue 1: Institutional controls are not in place

Recommendation 1: Implement Institutional controls

Issue 2: Groundwater monitoring is not being conducted at the site

Recommendation 2: Resume groundwater monitoring

### **Protectiveness Statement**

Sitewide Protectiveness Statement	
<i>Protectiveness Determination:</i> Short-term Protective	<i>Addendum Due Date (if applicable):</i>
<i>Protectiveness Statement:</i> The remedy remains protective of human health and the environment in the short-term. In order for the remedy to be protective in the long-term, institutional controls need to be implemented and groundwater monitoring should be resumed.	



**Next Review**

The next five-year review report for the Chemical Control Corporation Superfund site is required five years from the completion date of this review.

**Table 1: Chronology of Site Events**

<b>Event</b>	<b>Date(s)</b>
Initial discovery of problem or contamination	1979
Pre-NPL responses	1979
Final NPL listing	1983
Removal actions	1979
Remedial Investigation/Feasibility Study complete	1987
ROD signature	1987
Enforcement documents (CD, AOC, Unilateral Administrative Order)	1991
Remedial design start	1990
Remedial design complete	1992
On-site remedial action construction start	1992
RA Construction completion	1994
Construction completion date	1993
First five-year review	1998
Second five-year review	2004
Third five-year review	2009

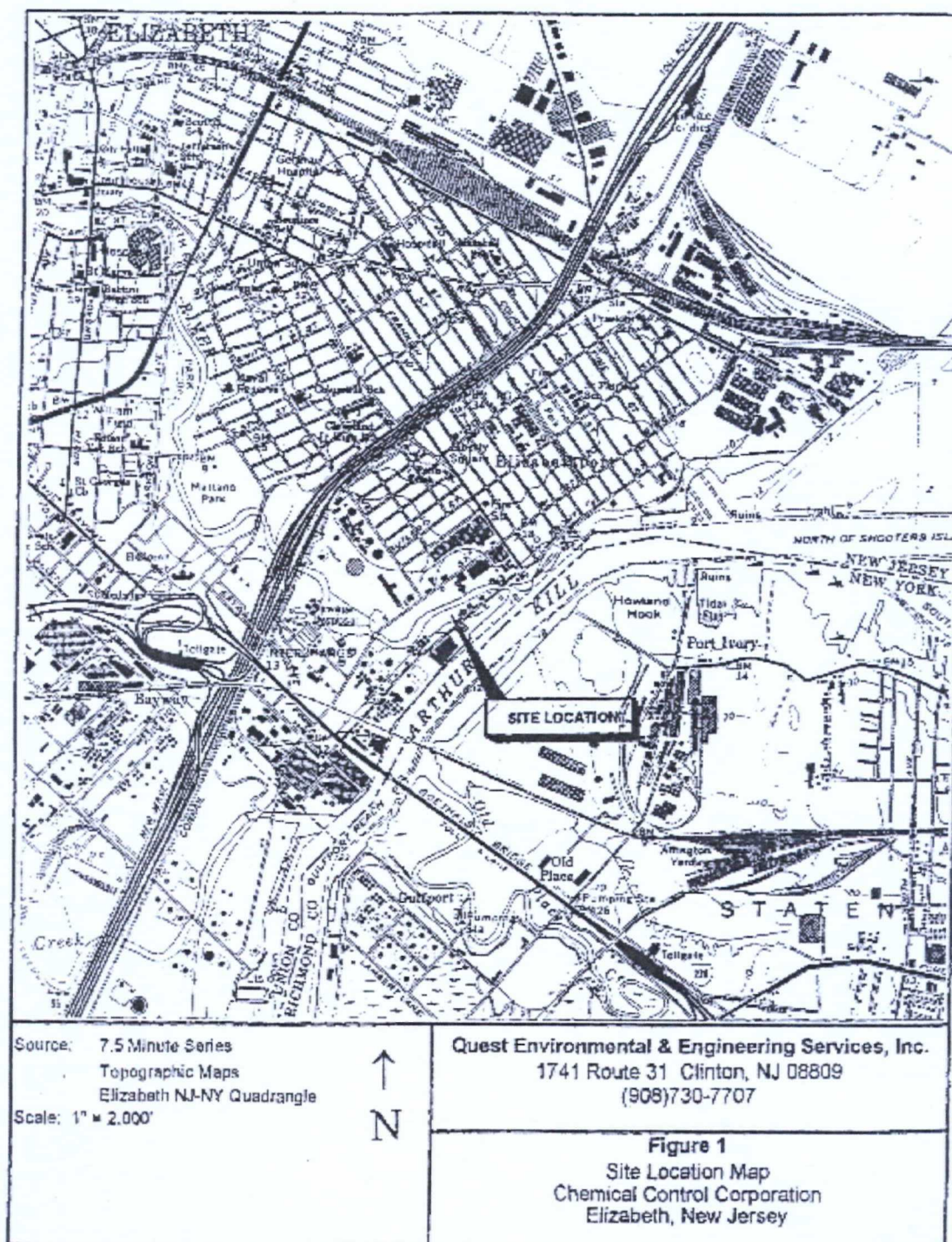
**Table 2: Solidified Core Permeability Results**

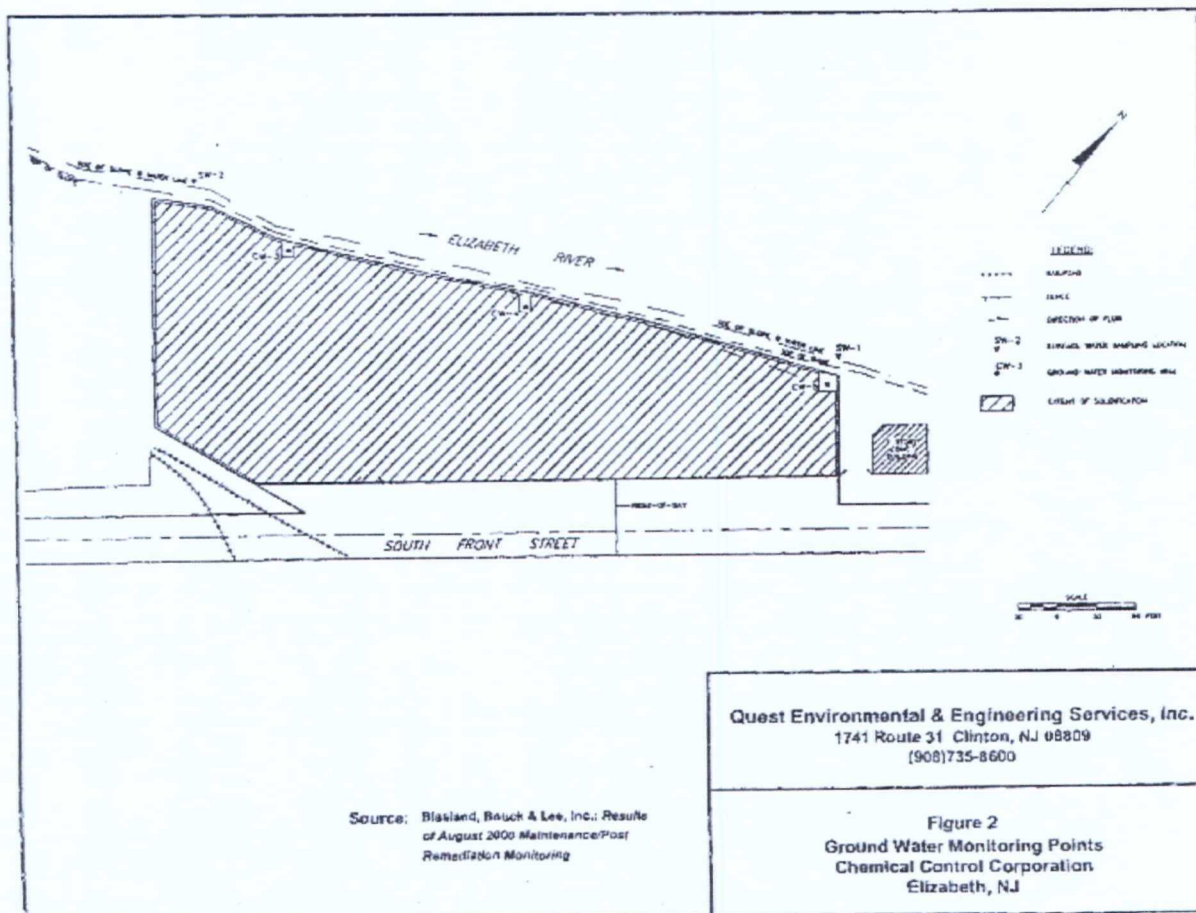
Test Date Qtr.	Year	Hydraulic Conductivity Test Results (cm/sec)
3Q	1994	$9.6 \times 10^{-8}$
4Q	1995	$7.5 \times 10^{-8}$
4Q	1996	$2.8 \times 10^{-8}$
4Q	1997	$7.3 \times 10^{-8}$
---	1998	-----
1Q	1999	$1.5 \times 10^{-8}$
1Q	2000	$2.7 \times 10^{-8}$
---	2001	-----
2Q	2002	$4.0 \times 10^{-9}$
3Q	2003	$4.1 \times 10^{-9}$
4Q	2004	$1.6 \times 10^{-9}$
4Q	2005	$1.65 \times 10^{-7}$
4Q	2006	$1.31 \times 10^{-9}$
4Q	2007	$7.76 \times 10^{-8}$
4Q	2008	$1.57 \times 10^{-8}$
4Q	2009	$1.45 \times 10^{-7}$ *
4Q	2010	$2.67 \times 10^{-6}$ *
4Q	2011	$3.94 \times 10^{-8}$
4Q	2012	$7.00 \times 10^{-8}$
4Q	2013	$5.69 \times 10^{-8}$

\* Soil-cement samples had holes throughout ranging in size from ~ 0.5 to 0.05 and the top of the core sample was uneven and porous looking – (sample integrity may be compromised) Note: All test results have met the Performance Standard of a hydraulic conductivity  $<1 \times 10^{-5}$  cm/sec.

**Table 3: Documents, Data and Information Reviewed in Completing the Five-Year Review**

<b>Document Title, Author</b>	<b>Submittal Date</b>
Record of Decision for the Chemical Control Superfund Site	1987
Five-Year Report for the Chemical Control Superfund Site	2009
2012 Soil Sample Permeability Testing Results	2012
2013 Soil Sample Permeability Testing Results	2014







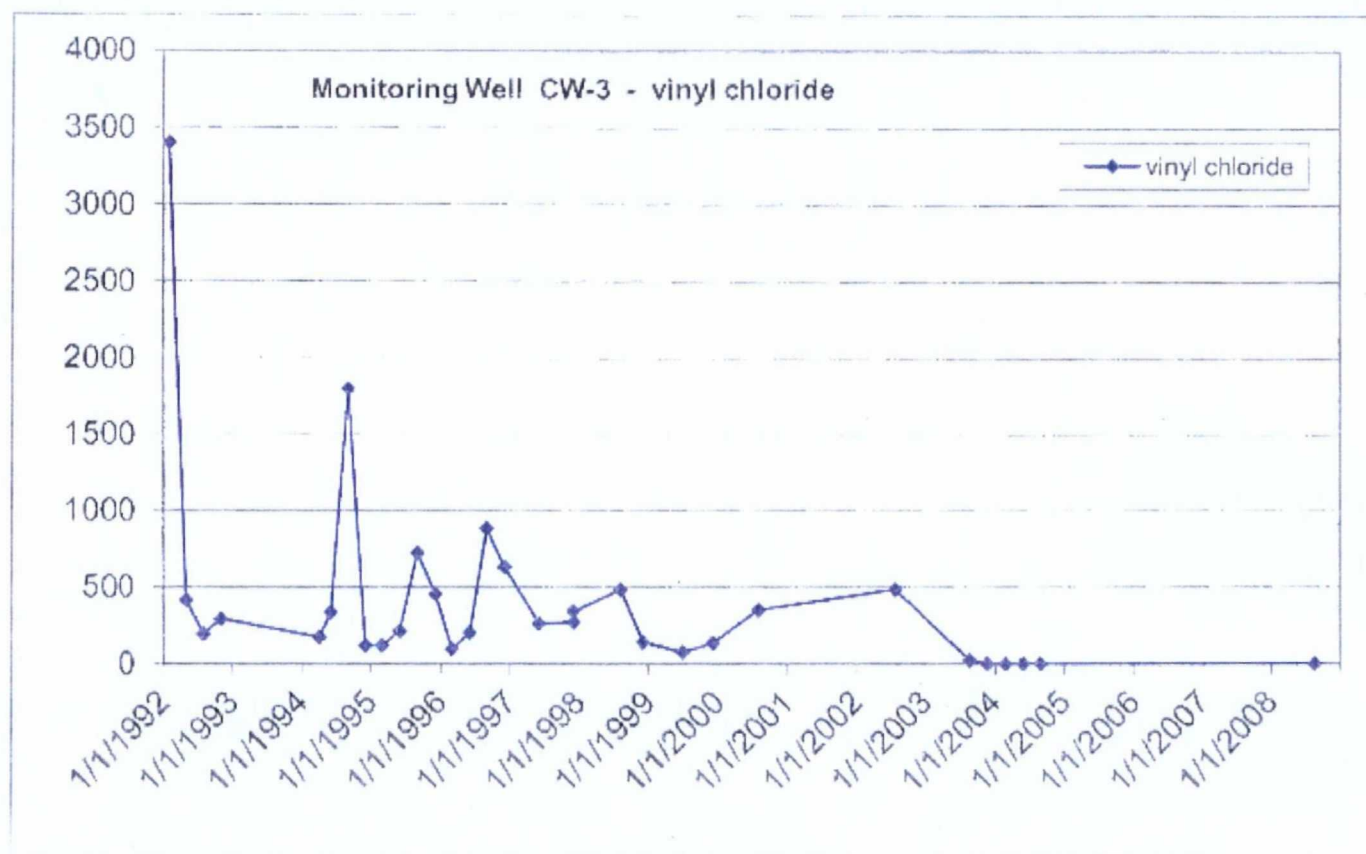


Figure 3

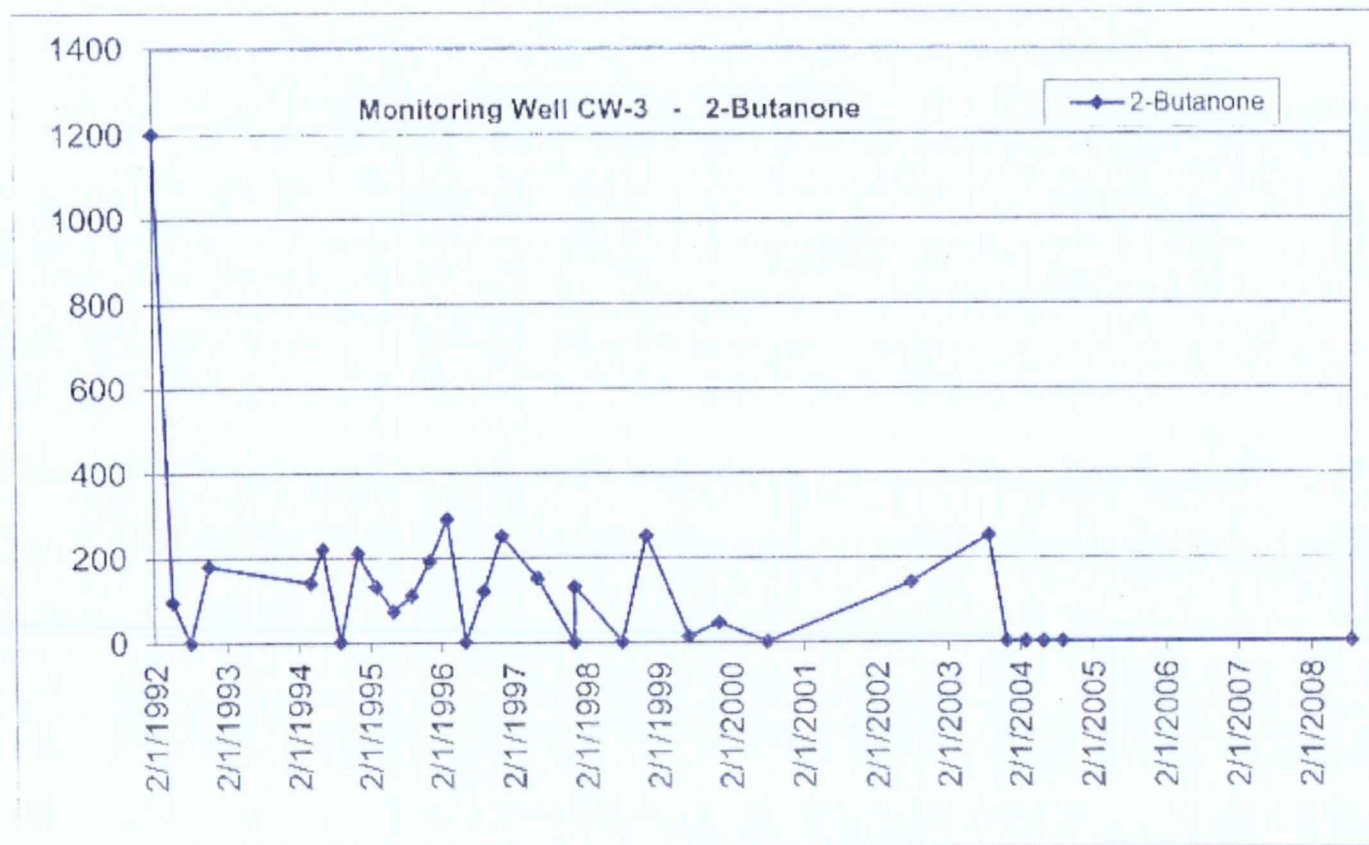


Figure 4



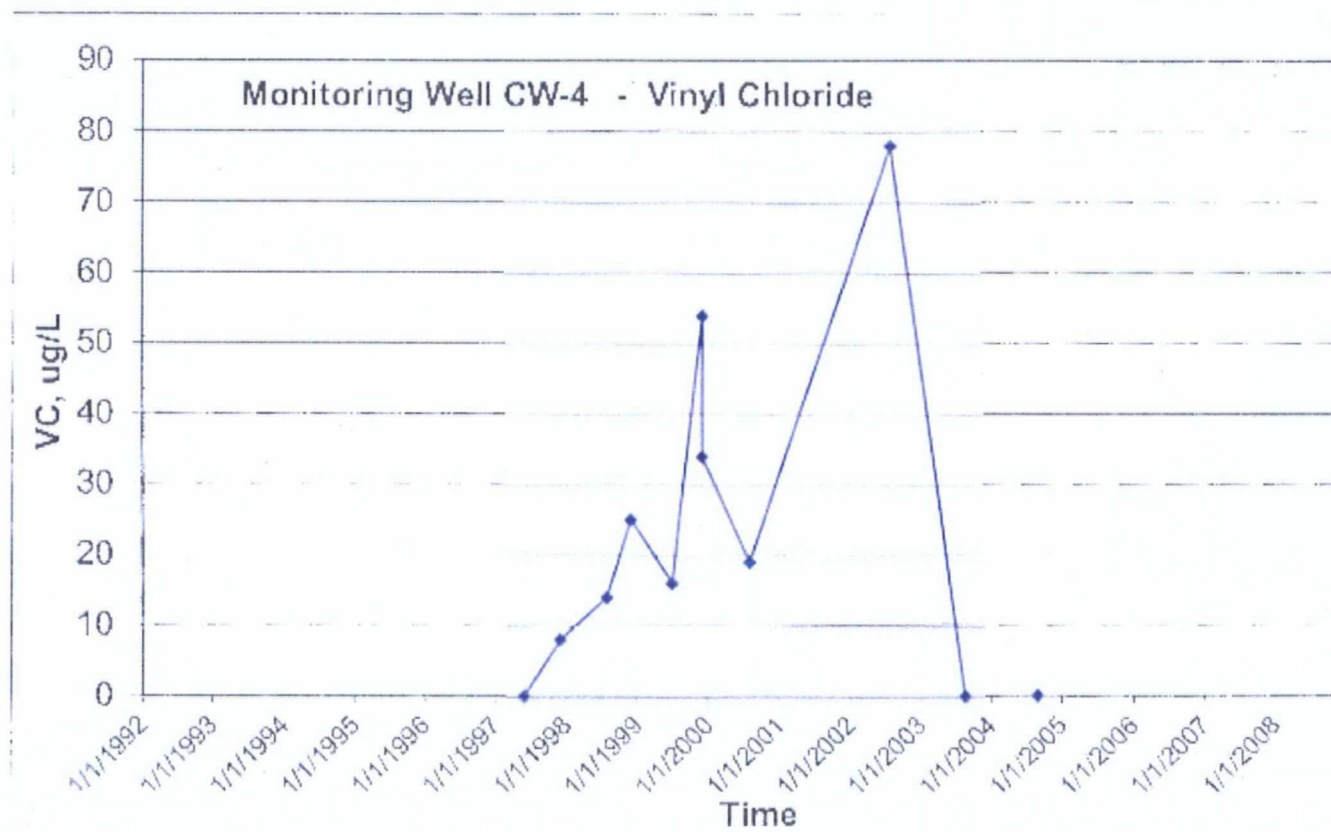


Figure 5